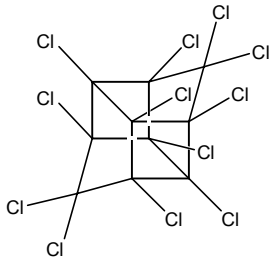
MIREX
CAS No. 2385-85-5
First Listed in the *Second Annual Report on Carcinogens*



CARCINOGENICITY

Mirex is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (IARC V.5, 1974; IARC V.20, 1979; IARC S.7, 1987; NTP 313, 1990). When administered by gavage for 4 weeks followed by incorporation in the diet, mirex increased the incidence of hepatomas in mice of both sexes. When administered in the diet, mirex increased the incidence of neoplastic nodules of the liver in rats of both sexes, pheochromocytomas of the adrenal gland in male rats, and mononuclear cell leukemias in female rats.

There are no adequate data available to evaluate the carcinogenicity of mirex in humans (IARC V.20, 1979; IARC S.7, 1987).

PROPERTIES

Mirex occurs as white, odorless crystals. It is practically insoluble in water and soluble in dioxane, xylene, benzene, carbon tetrachloride, and methyl ethyl ketone. A technical grade of mirex was formerly available in the United States as a white crystalline solid. Insect bait formulations may contain 0.075%-0.5% mirex. Chlordecone (Kepone®) has been found in technical mirex at concentrations up to 2.58 mg/kg, and in mirex bait up to 0.25 mg/kg (see Kepone®, Section III.B).

USE

Until EPA cancelled the registrations of pesticides containing this chemical in 1977, mirex was used extensively in the southeastern United States to control the fire ant. From 1962 to 1978, about 132 million acres in 10 states were treated with mirex bait (amounting to 497,000 lb of mirex), mainly by aerial application. Mirex was also used to treat other species of ants and yellow jackets, but it was most effective as a species-specific pesticide (IARC V.20, 1979). Mirex (marketed under the trade name Dechlorane) is also used as a fire retardant for plastics, rubber, paper and electrical goods (HSDB, 1989).

PRODUCTION

Technical-grade mirex has not been produced commercially in the United States since 1967. The insecticidal baits containing mirex were produced until 1975. Mirex was imported into the United States until it was banned (IARC V.20, 1979). Before cancellation of its registrations for technical products, two U.S. producers manufactured significant amounts of mirex and some quantities also were imported; however, no production or import volumes were available. There were no data on exports of mirex. Mirex first became commercially available in the United States in 1958 (IARC V.20, 1979).

EXPOSURE

The primary routes of potential human exposure to mirex are ingestion and inhalation. The National Occupational Hazard Survey, conducted by NIOSH from 1972 to 1974, estimated that 932 workers were possibly exposed to mirex in the workplace (NIOSH, 1976). Because insecticidal use of mirex was discontinued, the risk of potential direct human exposure is small. However, investigators have detected mirex residues in water, soil, food and beverages, and human tissues for as long as twelve years after exposure (IARC V.20, 1979). Mirex is very stable at normal temperatures and is resistant to biological and chemical degradation. Photolysis of mirex may occur, but adsorption is likely to be a more important fate process. Mirex is known to slowly degrade in soil to yield chlordecone (Kepone®) and mono- and dihydro- derivatives. Volatilization half-life in a model river (22°C, 1 m deep, flow rate 1m/sec, and wind speed 3 m/sec) has been estimated at 10.7 hours. This figure however, does not take into effect adsorption. Volatilization half-life from a model pond is 1143 years considering adsorption, but only 5.1 days excluding adsorption effects. Mirex will bioaccumulate in aquatic organisms (HSDB, 1989). Additional exposure information may be found in the ATSDR Toxicological Profile for Mirex and Chlordecone (ATSDR, 1995f).

REGULATIONS

EPA regulates mirex under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and Food, Drug, and Cosmetic Act (FD&CA). EPA cancelled the registrations of pesticides containing mirex under FIFRA, with specified termination of uses of existing stock. The State of Mississippi received an emergency exemption from EPA for specific uses effective through 6/79. FD&CA evaluates and sets the tolerances of mirex in agricultural commodities. EPA has proposed regulating mirex wastes under RCRA, and a water quality criteria document is being prepared on the compound under the Clean Water Act (CWA). OSHA regulates mirex under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table B-87.